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12/29/2003

Tai-Cheng Yu

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25859

7590

10/18/2005

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EXAMINER

QI, ZHI QIANG

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 10/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No. ^{uk}

10/748,315

Applicant(s)

YU ET AL.

Examiner

Mike Qi

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by US 6,283,602 B1 (Kawaguchi et al).

Claims 1 and 15, Kawaguchi discloses (col.1, lines 14-33; Fig.10) that a lighting device (surface lighting device) for a display device comprising:

- a light guide (101) having a light incident surface (101a);
- point light source (102) opposite to the light incident surface (101a);
- lenses (micro-lens) (103) located between the point light source (102) and the light incident surface (101a) for collimating divergent rays emitted from the point light source (102) into parallel rays;
- the light guide (101) and point light source (102) are placed at respective working distance from the micro-lens (because the lens 103 and the light guide 101 and light source 102 are different elements that should be different parts of the device, and they should have a certain working distance), such that the divergent rays emitted from the point light source are coupled into the light incident surface via the lens (micro-lens).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,283,602 B1 (Kawaguchi et al).

Regarding claim 10, Kawaguchi teaches the invention set forth above. Although Kawaguchi does not explicitly disclose in the Fig.10 that a surface lighting device arranged under the liquid crystal panel, Kawaguchi discloses (col.3, line 19 – col.4, line 14; Fig.1) that a lighting device (4) (a surface lighting device) arranged under the liquid crystal panel (2), such that illuminating the liquid crystal panel, and that is conventional to use liquid crystal panel and arrange a surface lighting device under the liquid crystal panel as a backlight for achieving uniform brightness of the image display (see col.2, lines 29-45).

Therefore, it would have obvious to those skilled in the art at the time the invention was made to modify the lighting device with the teachings of arranging a surface lighting device under the liquid crystal panel as taught by Kawaguchi, since the skilled in the art would be motivated for achieving uniform brightness of the image display (see col.2, lines 29-45).

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5. Claims 2-7, 11-14 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawaguchi as applied to claims 1, 10 and 15 above, and further in view of US 5,745,519 (Ruda et al).

Regarding claims 2-4, 11-14 and 16-17, Kawaguchi teaches the invention set forth above except for the micro-lens having a superconic cross-section; having a plane surface or a concave surface facing the point light source, and a convex surface opposite the light incident surface; and the light being collimated from the point light source so as to couple the light beam into the light incident surface substantially parallel or the coupled non-divergent rays are substantially parallel, and the parallel is perpendicular to the light incident surface of the light guide.

Ruda discloses (col.1, lines 23 – 33; col.2, line 33 – col.3, line 54; Figs. 2-4) that using mirolens having superconic cross-section for focusing light emitted by a point light source, and such focusing would collimate the light beam to emit parallel light beam, and such parallel light beam (non-divergent rays) are perpendicular to the light incident surface; and such superconic lens having a plane surface or a concave surface facing the point light source and a convex surface opposite to the light incident surface (the light beams enter into the optical fiber that is the same principle as the light beams enter into the light guide) as shown in Figs 2-4. Ruda indicates (col.1, lines 23-33) that such microlens with a superconic cross section produces a high coupling efficiency almost 92 to 95%.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to modify the lighting device of Kawaguchi with the teachings of

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using micro-lens having superconic cross section as taught by Ruda, since the skilled in the art would be motivated for achieving parallel light beam coupling high efficiency to the light incident surface of the light guide (see col.1, lines 23 – 33).

Regarding claim 5, Kawaguchi discloses (col.4, lines 4-14 and abstract) that the point light source is tungsten lamp (miniature bulb) or LED (light emitting diode), and that is conventional.

Regarding claims 6-7, Kawaguchi discloses (col.4, lines 4-14; Fig.1) that the light guide (16) having parallelepiped shape as shown in Fig.1, and having a light emitting surface (16a) adjoining to the light incident surface (16b) and a bottom surface opposite to the light emitting surface (16a).

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawaguchi and Ruda as applied to claims 1-7 and 10-17 above, and further in view of US 6,533,440 B2 (Koyama et al).

Regarding claim 8, Kawaguchi and Ruda teach the invention set forth above except for the bottom surface of the light guide having a dot pattern thereon or having a plurality of v-cut grooves therein.

Koyama discloses (col.1, lines 10-25; Fig.1) that the bottom surface of the light guide plate having a dot-printed plane (2) (dot-pattern) so as to prevent the light leakage, and the v-cut groove pattern would be an obvious variation as the light scattering and diffraction.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to modify the lighting device of Kawaguchi and Ruda with the

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teachings of arranging a dot-pattern on the bottom surface of the light guide as taught by Koyama, since the skilled in the art would be motivated for preventing the light leakage (see col.1, lines 10-25).

7. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawaguchi and Ruda as applied to claims 1-7 and 10-17 above, and further in view of JP 2002-93222.

Regarding claim 9, Kawaguchi and Ruda teach the invention set forth above except for the light incident surface of the light guide having an anti-reflective film.

JP 2002-93222 discloses (paragraph 0017 and 0027; Figs.1-2) that the light guide (4) is provided with an anti-reflection film (20) at the light incident end (5) so as to reduce the light loss and improve the light utilization.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to modify the lighting device of Kawaguchi and Ruda with the teachings of arranging an anti-reflective film on the light incident surface as taught by JP 2002-93222, since the skilled in the art would be motivated for preventing the light loss and improving the light utilization (see paragraph 0017 and 0027).

Response to Arguments

8. Applicant's arguments filed on Sep.29, 2005 have been fully considered but they are not persuasive.

1) The references such as Kawaguchi, Ruda and Koyama read the limitations as

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claimed. The lens or microlens have same function for converting the light emitted from point light source into parallel lights. Because the lights is diverged by the lens or microlens The Fig,10 of Kawaguchi shows a schematic lighting device that does not restrict the lens (103) and the light guide (101) being one element. The assembly should have different elements for the lens and the light guide. The reference Ruda clearly shows (Figs.2-4) the microlens converting the point light into parallel lights.

2) The reference Ruda is relied on to teach microlens with a superconic cross section producing a high coupling efficiency. The reference Koyama is relied on to teach the bottom surface of the light guide plate having a dot-printed plane (2) (dot-pattern) so as to prevent the light leakage. The reference JP 2002-93222 is relied on to teach the light guide (4) is provided with an anti-reflection film (20) at the light incident end (5) so as to reduce the light loss and improve the light utilization.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Qi whose telephone number is (571) 272-2299.

The examiner can normally be reached on M-T 8:00 am-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mike Qi
October 11, 2005

Andrew Schechter
ANDREW SCHECHTER
PRIMARY EXAMINER